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The time period for reply, if any, is set in the attached communication.

## DETAILED ACTION

### *Response to Amendment*

1.      Claims 5 – 13 are pending.

### *Claim Rejections - 35 USC § 103*

2.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.      Claims 5, 9, 6, 10, 11, 7, 12, 8, 13 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Jamieson et al. (US 7039687 B1) in view of Nurenberg et al. (US

6181697 B1).

        **Regarding claims 5, 9,** Jamieson et al. disclose a virtual private network

construction system for a public data communication network (*""VNP may be formed by*

*connecting two, four or more networks across the shared network" interpreted as a*

*virtual private network construction system for a public data communication network;*

*Abstract, Fig. 1, col. 3, lines 20 – 27*) comprising: whereby the virtual private network is

constructed with the virtual relaying structures that are specific to a same multicast

address in the first and the second relaying apparatuses, with the unicast virtual links

establish between all pairs of the virtual relaying structures and with virtual interfaces

receiving packets from outside the public data communication network (*"multicast",*

*"unicast"; Fig. 1, Fig. 3, col. 2, lines 31 – 45, col. 3, lines 55 – 67, col. 4, lines 1 – 4, col.*

*5, lines 13 – 42, 54 – 64*). Jamieson et al. also disclose implicitly first relaying

apparatuses with virtual relaying structure generating and multicasting control packets each of which is destined to a multicast address assigned to the virtual relaying structure and contains a unicast address specific to the virtual relaying structure *("element A 10,Private Network Adaptation Devices " interpreted as first relaying apparatuses with virtual relaying structure, "hello, Link state Advertisement..,", and used by all other PNADs for unicast transmission"; Fig. 1, col. 3, lines 59 – 67, col. 4, lines 1 – 6, col. 5, lines 13 – 42),* second relaying apparatuses with virtual relaying structure, which receives the control packets from the first relaying apparatuses with the multicast address as destined for the virtual relay structure ("element B 10, Private Network Adaptation Devices", and "interconnected using bi-directional multipoint-to-multipoint LSP"; *Fig. 1, col. 3, lines 55 – 67, col. 4, lines 1 – 6),* establishing unicast virtual links using the unicast address in the control packets with the first relaying apparatuses which are the transmitting sources of the control packets and returning reply packets to the first relaying apparatuses through the unicast virtual links *("used by all other PNADs for unicast transmission"; col. 3, lines 55 – 59, col. 5, lines 13 - 42).*

Jamieson et al. do not disclose explicitly first relaying apparatuses with virtual relaying structure generating and multicasting control packets each of which is destined to a multicast address assigned to the virtual relaying structure and contains a unicast address specific to the virtual relaying structure, and second relaying apparatuses with virtual relaying structure, which receives the control packets from the first relaying apparatuses with the multicast address as destined for the virtual relaying structure, establishing unicast virtual links using the unicast  address in the control packets with

the first relaying apparatuses which are transmitting sources of the control packets

returning reply packets to the first relaying apparatuses through the unicast virtual links.

Nurenberg et al. teach first relaying apparatuses with virtual relaying structure

generating and multicasting control packets each of which is destined to a multicast

address assigned to the virtual relaying structure *("element 120, Multicast-Unicast*

*Server" interpreted as first relaying apparatus; Fig.1, col. 3, lines 29 – 45, lines 66 – 67,*

*col. 4, lines 1 – 6)* and contains a unicast address specific to the virtual relaying

structure *("unicast IP endpoint address"; col. 4, lines 6 – 11)*, and second relaying

apparatuses with virtual relaying structure, which receives the control packets from the

first relaying apparatuses with the multicast address as destined for the virtual relaying

structure, establishing unicast virtual links using the unicast  address in the control

packets with the first relaying apparatuses which are transmitting sources of the control

packets and returning reply packets to the first relaying apparatuses through the unicast

virtual links *("element 121, Multicast-Unicast Server" interpreted as second relaying*

*apparatus; Fig. 1, Fig.1, col. 3, lines 29 – 45, lines 66 – 67, col. 4, lines 1 – 28)*.

At time the invention was made it would have been obvious to a person of

ordinary skill in the art to modify the teachings of Jamieson et al. to include the features

of first relaying apparatuses with virtual relaying structure generating and multicasting

control packets each of which is destined to a multicast address assigned to the virtual

relaying structure and contains a unicast address specific to the virtual relaying

structure, and second relaying apparatuses with virtual relaying structure, which

receives the control packets from the first relaying apparatuses with the multicast

address <u>as destined for the virtual relaying structure,</u>, establishing unicast virtual links using the unicast address in the control packets with the first relaying apparatuses which are transmitting sources of the control packets returning reply packets to the first relaying apparatuses through the unicast virtual links as taught by Nurenberg et al. One of ordinary skill in the art would be motivated to do so for providing a endpoint client on a Unicast network with the ability to access a Multicast session on an Multicast network and re-Multicast that session to other endpoint clients *(as suggested by Nurenberg et al., see col. 1, lines 19 – 22)*.

      **Regarding claims 6, 10,** Jamieson et al. disclose the virtual private network construction method, system, apparatus claimed wherein the second relaying apparatuses stashing the unicast virtual links authenticate the control packets received *(col. 5, lines 36 - 42)*.

      **Regarding claim 11,** Jamieson et al. disclose the relaying apparatus as claimed further comprising means for generating a routing table for each of a plurality of virtual networks logically independent of one another *("forwarding table" interpreted as a routing table for each of a plurality of virtual networks logically independent of one another; col. 5, lines 47 – 53)*, and means for performing a packet relay of each virtual network based on the routing table *(col. 5, lines 54 – 56)*.

      **Regarding claims 7, 12,** Jamieson et al. disclose the virtual private network construction method, system, apparatus claimed wherein the virtual links comprise IP tunnels *("internet protocol (IP) tunneling"; col. 1, lines 36 – 39)*.

Regarding claims 8, 13, Jamieson et al. disclose a virtual private network construction method, system, apparatus wherein the unicat virtual links comprise MPLS tunnels (*"multipoint-to-point LSPs used by all other PNADs for unicast transmission; col. 3, lines 55 – 61).*

## Response to Arguments

4.      Applicant's arguments filed on 1/05/2009 with respect to claims 5 – 13 have been fully considered but they are not persuasive.

*Regarding claims 5 and 9,* applicant argues references Jamieson et al. and Nurenberg et al. do not teach or suggest, however, control packets that are destined to a multicast address assigned to a virtual relaying structure and multicast by the first relaying apparatuses, as recited in claims 5 and 9. Examiner respectfully disagrees.

Examiner contends the combined system of references Jamieson et al. and Nurenberg et al. disclose control packets that are destined to a multicast address assigned to a virtual relaying structure and multicast by the first relaying apparatuses. Examiner interpreted control packets as hello packets, link state advertisement and Address resolution protocol, *see Jamieson et al. col. 3, lines 55 – 67, col. 4, lines 1 – 6, see also col.5, lines 13 – 42.*

Applicant then argues the combined system of references Jamieson et al. and Nurenberg et al. do not teach or suggest, however, "second relaying apparatuses with virtual relaying structure...with the multicast address as destined for the virtual relaying

structure...returning reply packets...through the unicast virtual links," as recited in claims

5 and 9. (Emphasis added). Examiner respectfully disagrees.

Examiner contends the combined system of references Jamieson et al. and

Nurenberg et al. teach "second relaying apparatuses with virtual relaying structure...

with the multicast address as destined for the virtual relaying structure...returning reply

packets...through the unicast virtual links,"

Examiner interpreted "second relaying apparatuses with virtual relaying structure"

as element B 10, Private Network Adaptation Devices, *see Jamieson et al. Fig. 1, Fig.*

*3, col. 3, lines 55 – 67,* and interpreted" which receives the control packets from the first

relaying apparatuses with the multicast address as destined for the virtual relay

structure " as interconnected using bi-directional multipoint-to-multipoint LSP, used for

sending multicast datagrams"; *see Jamieson et al. Fig. 1, col. 3, lines 55 – 67, col. 4,*

*lines 1 – 6, and interpreted* "establishing unicast virtual links using the unicast address

in the control packets with the first relaying apparatuses which are the transmitting

sources of the control packets and returning reply packets to the first relaying

apparatuses through the unicast virtual links" as *used by all other PNADs for unicast*

*transmission, and "point-to-point link, see Jamieson et al., col. 3, lines 55 – 59, col. 5,*

*lines 13 - 42.* Reference Jamieson et al. do not disclose explicitly the limitations of

multicast address and unicast address. Reference Nurenberg et al. remedy Jamieson

deficiencies by disclosing the multicast address and unicast address as well as unicast

and multicast network structure.

Applicant also argues reference Jamieson et al. fail to teach or suggest, however, a virtual private network constructed with the virtual relaying structures which are specific to same multicast address in the first and the second relaying apparatuses. Jamieson et al. merely describe distribution of VPN information for establishing multiple label switched paths therebetween. Examiner respectfully disagrees.

Examiner contends reference Jamieson et al. suggest a virtual private network constructed with the virtual relaying structures which are specific to same multicast address in the first and the second relaying apparatuses. Examiner interpreted "a virtual private network constructed with the virtual relaying structures which are specific to same multicast address in the first and the second relaying apparatuses" as all PNADs of a VPN subnet may also be interconnected using a bi-directional, multipoint-to-multipoint LSP. This could be used for sending multicast datagrams, *see Jamieson et al., Fig. 1, Fig. 3, col. 2, lines 31 – 45, col. 3, lines 55 – 67, col. 4, lines 1 – 4, col. 5, lines 13 – 42, 54 – 64.*

Applicant then further argues the combined system of references Jamieson et al. and Nurenberg et al., failed to disclose or suggest,

"a virtual private network construction system for a public data communication network comprising:

first relaying apparatuses with virtual relaying structure generating and <u>multicasting control packets each of which is destined to a multicast address assigned to the virtual relaying structure and contains a unicast address specific to the virtual relaying structure</u>, and

second relaying apparatuses with virtual relaying structure, which <u>receives the control packets from the first relaying apparatuses</u> with the multicast address as destined for the virtual relaying structure, <u>establishing unicast virtual links using the unicast address in the control packets with the first relaying apparatuses</u> which are transmitting sources of the control packets and <u>returning reply packets to the first relaying apparatuses through the unicast virtual links,</u>

whereby <u>the virtual private network is constructed with the virtual relayin~ structures that are specific to a same multicast address in the first and the second relaying apparatuses, with the unicast virtual links established between all pairs of the virtual relaying structures and with virtual interfaces receiving packets from outside the public data communication network,</u>" as recited in claim 5. (Emphasis added).

Examiner respectfully disagrees.

Examiner contends the combined system of references Jamieson et al. and Nurenberg et al., disclose,

<u>multicasting control packets each of which is destined to a multicast address assigned to the virtual relaying structure and contains a unicast address specific to the virtual relaying structure,</u> and

<u>receives the control packets from the first relaying apparatuses,</u>

<u>establishing unicast virtual links using the unicast address in the control packets with the first relaying apparatuses</u> which are transmitting sources of the control packets and <u>returning reply packets to the first relaying apparatuses through the unicast virtual links,</u>

whereby <u>the virtual private network is constructed with the virtual relayin~</u>
<u>structures that are specific to a same multicast address in the first and the second</u>
<u>relaying apparatuses, with the unicast virtual links established between all pairs of the</u>
<u>virtual relaying structures and with virtual interfaces receiving packets from outside the</u>
<u>public data communication network.</u>"

Examiner interpreted control packets as hello packets, link state advertisement
and Address resolution protocol, *see Jamieson et al. col. 3, lines 55 – 67, col. 4, lines 1*
*– 6, see also col.5, lines 13 – 42.*. Examiner interpreted the claimed subject matter
"multicasting control packets each of which is destined to a multicast address assigned
to the virtual relaying structure and contains a unicast address specific to the virtual
relaying structure" as all PNADs of a VPN subnet may also  be interconnected  ….for
sending multicasting datagrams,...the response packet can be unicast, otherwise it is
sent on the multicast MAC LSP, *see Jamieson et al. col. 3, lines 55 – 67, col. 4, lines 1*
*– 6, see also col.5, lines 13 – 42,* and interpreted "receives the control packets from the
first relaying apparatuses" as the incoming label will be viewed layer 3 as the MAC
address, see *Jamieson et al, col. 5, lines 9 – 10, 36 - 42*, and interpreted "establishing
unicast virtual links using the unicast address in the control packets with the first
relaying apparatuses … and returning reply packets to the first relaying apparatuses
through the unicast virtual links" as the originating PNAD will receive the response ARP
packet….., once the mapping for next hop IP address to MAC label is established…,
see *Jamieson et al, col. 5, lines 36 – 52.*

Examiner further interpreted the claimed subject matters of "the virtual private network is constructed with the virtual relaying structures that are specific to a same multicast address in the first and the second relaying apparatuses" as all PNADs of a VPN subnet may also be interconnected using a bi-directional, multipoint-to-multipoint LSP. This could be used for sending multicast datagrams, *see Jamieson et al., Fig. 1, Fig. 3, col. 2, lines 31 – 45, col. 3, lines 55 – 67, col. 4, lines 1 – 4, col. 5, lines 13 – 42, 54 – 64.*and interpreted "with the unicast virtual links established between all pairs of the virtual relaying structures and with virtual interfaces receiving packets from outside the public data communication network" as each PNAD has a multipoint-to-point LSP directed to it. It is used by all other PNADs for unicast tranmsission;..to establish a mapping between the new label and the IP address of VSI of the PNAD at the other end of the multipoint-to point LSP, see Jamieson et al. *Fig. 1, Fig. 3, col. 2, lines 31 – 45, col. 3, lines 55 – 67, col. 4, lines 1 – 4, col. 5, lines 13 – 42, 54 – 64.*

Reference Jamieson et al. do not explicitly disclose the limitations of multicast address and unicast address. Reference Nurenberg et al. remedy Jamieson deficiencies by disclosing the multicast address and unicast address as well as unicast and multicast network structure.


### Conclusion

5.      The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Morgenstern et al. (US 6587467 B1).
- Delancey et al. (US 6937574 B1).

- Rao et al. (US 6674756 B1).
- Casey et al. (US 6205488 B1).
- Yamauchi (US 7272146 B2).

6.    Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action.  Accordingly, **THIS ACTION IS MADE FINAL**.  See MPEP

§ 706.07(a).  Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action.  In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action.  In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

1.    Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Andrew C. Lee whose telephone number is (571)272-
3131.  The examiner can normally be reached on Monday through Friday from 8:30am -
5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Edan Orgad can be reached on (571) 272-7884.  The fax phone number for
the organization where this application or proceeding is assigned is 571-273-8300.

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